Air Resources Board

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TECHNICAL BULLETIN 400-1 (Revised) **BAM-1020 PARTICULATE MONITOR**
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Issues

Some Air Quality Surveillance Branch (AQSB) staff perform **BAM-1020 leak test procedures** in the normal operating mode which may cause the pump to shut off before flow has been re-established through the instrument by opening the flow test adaptor valve. In addition, the "Leak Check" sections in the BX-302-9800 and Rev. G of the BAM-1020 operators manual, page 32, Section 5.3, step 5 requires that the operator "Turn the pump off, remove the leak test valve, and re-install the inlet heads".

Symptom

When the leak check procedure is performed as described above, AQSB staff have observed that the BAM-1020's flow control valve and Mass Flow Meter tubing can become contaminated from "blow back" of carbon pump residue. Operational symptoms include erratic flow control and eventual failure of the flow control system.

Figure 1 Contaminated flow controller resulting from pump blow back.

Figure 2 Contaminated tubing resulting from pump blow back.

Solutions

AQSB staff and Primary Quality Assurance Organization (PQAO) district staff should perform the BAM-1020 leak check in the following manner.

For the purposes of data and operations continuity, all Leak Tests performed on the BAM-1020, regardless of version, will henceforth start from the **TEST: PUMP mode**

1. From the main display screen, select the **TEST**, then **PUMP** mode on the control panel of the BAM-1020. This will interrupt the sample cycle for the hour.

2. Install a flow test adaptor (for instance, Met One BX-302, or equivalent) on the top of the intake tubing. This will usually require removing one or more inlet adaptor(s). Inlet adaptors that will accept the flow test adaptor's receptacle should remain in place for inclusion in the leak check. Begin the test by pressing the key under **PUMP ON**. Allow the flow to stabilize at the set point to approximately 16.7 liters per minute (volumetric). The BAM 1020 display in pump test mode is in standard liters per minute (SLPM) and may differ somewhat from the Volumetric Set Point.

3. Close the valve on the flow test adaptor, and note the flow value on the display of the BAM-1020.

4. Document the resulting value. Acceptable or failing values are specified in the AQSB SOP 400.

5. Slowly re-open the flow control valve. Allow the flow to stabilize, then press the **PUMP OFF** key.

6. Upon successful completion of the Leak Test, remove the flow test adaptor and reinstall the appropriate inlet head. Be careful that no foreign material is allowed into the sample inlet tube.

7. Perform the Self Test Procedure by selecting **TAPE** mode from the main screen, and then activate **SELF TEST**.

8. Return the instrument to the **OPERATE NORMAL** mode upon successful completion of Self Test. Operators and staff must ensure the BAM-1020 is sampling properly before departing the site. This may take as much as one hour or more.

Performing leak checks in this manner will allow flow to be re-established and prevent "back flow" caused by the reverse pressure differential developed inside the instrument. Until such time that the manufacturer has addressed this issue in their documentation, AQSB staff and ARB PQAO district staff should use the modified procedure as detailed in this technical bulletin.

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